

REMARKS/ARGUMENTS

Claims 1-6 and 12-20 were pending in the application and rejected. Applicant has amended claims 1-6 and claims 12-20. Applicant understands claims 1-6 and 12-20 to be rejected under 35 U.S.C. § 103. Applicant further understands claims 1-6 and 12-20 to be objected to based on informalities, and the drawings to be objected to under 35 USC § 112.

Regarding the objection to the drawings, Applicant has included a proposed corrected drawing for consideration by the Examiner. Applicant believes the proposed corrected drawing addresses the objection. Applicant further submits that the proposed corrected drawing does not add new matter. Applicant will provide an appropriate formal drawing if the proposed correction is deemed sufficient. Regarding the objections to the claims for informalities, Applicant has amended the claims to address these informalities. These amendments are technical in nature and do not affect the substance or scope of the claims.

Applicant does not concede the propriety of the rejections of the claims. Claims 1-5, 15 and 16 stand rejected over Hieda in view of Crewe further in view of Mizasawa and yet further in view of Nickel. The Office Action states that Nickel discloses use of carbon nanotubes and that these carbon nanotubes may thus be used in conjunction with the array of heads of Hieda, the housing and electrodes of Crewe and the tracking electrodes of Mizasawa. However, the various references are chosen to make this combination without regard to all that the references teach, particularly the aspects of the references which are incompatible with each other.

For example, Nickel discloses that carbon nanotubes are rugged and are not damaged by contact with a recording medium (thus solving a problem with Spindt emitters). See Nickel, paragraph 0010. Moreover, Nickel is designed to work with micromovers to provide a grid-like array of heads which each move over a small surface of a medium. See Fig. 3 and paragraph

0013. Nickel is designed for a system where the recording medium is not even moving – no reference is made to motion of the recording medium, only to scanning the heads over the (unmoving) recording medium. See Nickel at paragraph 0013 (heads may be scanned over medium). In such an instance, where the heads are moving but the medium is not, Nickel indicates that tolerances may be relaxed and carbon nanotubes may be used. The claimed invention clearly contemplates use of a carbon nanotube separated from a recording medium by a significant distance as can be seen in Fig. 3, for example, of the present application.

In contrast to Nickel, Crewe uses an electron gun which is far-removed from the recording medium. The electron gun of Crewe is mounted for movement across a disc which is rotated independently. See Crewe, Abstract. Thus, Crewe is designed for a different purpose and architecture from that of Nickel, and it is far from obvious that one would combine the teachings of Nickel and Crewe. Crewe also includes windings 84 shown in Fig. 2 which are required to deflect the e-beam of Crewe. See Crewe, col. 11, lines 44-55. These windings are not required in the claimed invention and introduce a level of complexity well beyond the straightforward design of the claimed invention as shown in Fig. 3 of the present application.

In contrast to Crewe, Hieda introduces an array of heads for use with highly specialized media. See, e.g., Hieda Abstract. Hieda provides a recording medium with recording cells regularly arrayed in a recording track and with isolation regions between recording tracks. See *id.* Additionally, Hieda is primarily concerned with magnetic recording (see, e.g., Examples 1-12, all of which are magnetic recording examples) and secondarily with a laser-based recording system (see, e.g., Examples 13 and 14). All of the examples suggest a rotating recording medium. Thus, one would not combine Hieda with the stationary medium and slightly moving heads of Nickel. Likewise, one would not combine Hieda with the electron gun of Crewe.

In contrast to Hieda, Mizasawa is focused on electron beams. However, it also differs significantly from the claimed invention and from other devices such as Crewe and Nickel. Mizasawa includes an array of electron generating sources and an array of electron detectors. See, e.g., Figs. 18 and 19. However, Mizasawa suggests that the spacing of such arrays is problematic for high-speed, high-density media. Moreover, Mizasawa indicates that the detectors must be separate from the electron generators. In contrast, Applicants claim an embodiment where detection electrodes are mounted on the housing of the electron emitting carbon nanotube, avoiding the need to space such electrodes apart from the electron emitting source or from each other. Similarly, Crewe suggests a single housing which would not be suitable for the spaced apart design of Mizasawa.

Moreover, Applicants note that Crewe was filed in 1986 and issued in 1988. Mizasawa was filed in some form 1987 and issued in 1993. Nickel was filed in 2001 and published in 2003. Hieda was filed in 2002 and issued in 2005. Clearly, this general area of inquiry has been a problem for a long time, indicating a long-felt need for a solution in this area. This militates against a finding of obviousness of the combination. Accordingly, Applicant submits that, for at least these reasons, the combination is improper and that the claims as amended should be allowed.

Regarding claims 6, 12 and 13, the claims are rejected over a combination of Hamada, Crewe, Mizasawa, Nickel and Jin. Applicant has already noted deficiencies in the combination of Crewe, Mizasawa and Nickel above. Applicant further notes that the detector of Jin appears to be used to detect deflection of the electron beam, rather than reflection of electrons from a medium, as claimed. See, e.g., Jin at col. 5, lines 7-10. To the extent that Jin is used for detection as claimed by Applicant, this conflicts with the teaching of Mizasawa that detectors are

placed separately from electron emitters. Additionally, Hamada is introduced for purposes of explaining the process of locating a track, fine-tuning location of the track and maintaining a location of a head. However, Hamada concerns a magnetic disk system. See, e.g., Hamada, col. 3, lines 15-30. Thus, Hamada suggests that controlling magnetic heads is appropriate, rather than using carbon nanotubes and electron beams as used in the other references. Also, note that Hamada uses a rotating medium in contrast to the fixed medium of Nickels. Accordingly, Applicant submits that, for at least these reasons, the combination is improper and that the claims as amended should be allowed.

Turning to claim 14, it stands rejected over Hamada in view of Crewe, further in view of Mizasawa, even further in view of Jin, still further in view of Nickel and yet further still in view of Teo. Applicant has already commented on the inappropriate nature of the combination of Hamada, Crewe, Mizasawa, Jin and Nickel. Applicant further notes that Teo is associated with magnetic disc drives (see Teo, paragraph 0003) and that Teo clearly relates to rotating media. Thus, it is not appropriate to combine Teo with Crewe, Mizasawa and Nickel at a minimum. Accordingly, Applicant submits that, for at least these reasons, the combination is improper and that the claim as amended should be allowed.

Turning to claims 17-20, the claims stand rejected over Hieda, Crewe, Mizasawa, Jin and Nickel. Applicant submits that for the reasons stated above, this combination is inappropriate. Furthermore, Applicant notes that this combination also demonstrates the long-felt need for a solution in this area of the art. Accordingly, Applicant submits that, for at least these reasons, the combination is improper and that the claims as amended should be allowed.

Applicant also notes that some clarifications have been made to the claims beyond the amendments to correct informalities. Applicant notes, for example, that the acceleration and

focus electrodes have been included in the claim. Moreover, Applicant notes that the detection electrode has been clarified as detecting reflection of electrons from a recording medium. These amendments are provided to clarify the claimed invention and to make clear that which was believed to be implicit in the prior claims. Applicant submits that no new matter has been added.

CONCLUSION


In view of the foregoing, Applicant(s) believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at the number listed below.

Respectfully submitted,

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